

Final

Site Investigation Report
Former Incinerators, Buildings 4428 and 4430, Parcel 96(7)

Fort McClellan
Calhoun County, Alabama

Prepared for:

U.S. Army Corps of Engineers, Mobile District
109 St. Joseph Street
Mobile, Alabama 36602

Prepared by:

IT Corporation
312 Directors Drive
Knoxville, Tennessee 37923

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Executive Summary

In accordance with Contract Number DACA21-96-D-0018, Task Order CK08, IT Corporation (IT) completed a site investigation (SI) at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), at Fort McClellan in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site and, if present, whether the concentrations present an unacceptable risk to human health or the environment. The SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), consisted of the sampling and analysis of eleven surface soil samples, four subsurface soil samples, and seven groundwater samples. In addition, four permanent and three temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information. As part of this SI, IT incorporated data previously collected by QST Environmental, Inc. at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

Chemical analyses of samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), indicate that metals, volatile organic compounds (VOC), semivolatile organic compounds (SVOC), pesticides, and dioxins were detected in site media. To evaluate whether the detected constituents pose an unacceptable risk to human health or the environment, analytical results were compared to the human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC.

The potential impact to human receptors is expected to be minimal. Although the site is projected for passive recreation reuse, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, metals that exceeded SSSLs were below their respective background concentrations or within the range of background values, with the exception of copper and silver in one surface soil sample (SI08-SS01). VOC, SVOC, pesticide, and dioxin analytical results were below SSSLs.

In groundwater, several metals were detected at concentrations exceeding SSSLs and background concentrations. However, the samples with the elevated metals results had high turbidity at the time of sample collection, which is believed to have caused the increased metals concentrations. Evaluation of lower-turbidity groundwater samples indicates that metals have not adversely

impacted groundwater at the site. VOC and SVOC concentrations in groundwater were below SSSLs.

Several metals were detected in surface soil at concentrations exceeding ESVs and background concentrations within and adjacent to Building 4430. Concentrations of TCE and PCE exceeded ESVs in several samples; however, 40 percent of these TCE results were in samples associated with a laboratory or field blank also containing TCE. Two pesticides (4,4'-DDT and 4,4'-DDE) exceeded ESVs in six surface soil samples. Since the site is located within the developed area of the Main Post and viable ecological habitat is limited, the threat to potential ecological receptors is low.

Based on the results of the SI, past operations at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), do not appear to have adversely impacted the environment. The metals and chemical compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT recommends "No Further Action" and unrestricted land reuse at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

1.0 Introduction

The U.S. Army has selected Fort McClellan (FTMC), located in Calhoun County, Alabama, for closure by the Base Realignment and Closure (BRAC) Commission under Public Laws 100-526 and 101-510. The 1990 Base Closure Act, Public Law 101-510, established the process by which U.S. Department of Defense (DOD) installations would be closed or realigned. The BRAC Environmental Restoration Program requires investigation and cleanup of federal properties prior to transfer to the public domain. The U.S. Army is conducting environmental studies of the impact of suspected contaminants at parcels within FTMC under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE contracted IT Corporation (IT) to provide environmental services for completion of the site investigation (SI) at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), under Contract Number DACA21-96-D-0018, Task Order CK08.

The U.S. Army Environmental Center (AEC) originally contracted QST Environmental, Inc. (QST) to perform the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). QST prepared an SI work plan (QST, 1998) and conducted field activities in the summer of 1998. Upon further evaluation of the site, the BRAC Cleanup Team (BCT) determined that additional data were needed to characterize the site. Therefore, the USACE contracted IT to collect an additional soil sample and four groundwater samples. IT installed four permanent groundwater monitoring wells. Additional groundwater sampling was required because the QST-installed temporary wells did not produce sufficient groundwater for a complete analysis.

This SI report summarizes field activities, including field sampling and analysis and monitoring well installation activities, and data compiled by IT and QST for the SI conducted at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

1.1 Project Description

The Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), were together identified as one area to be investigated prior to property transfer. The site was classified as a Category 7 site in the environmental baseline survey (EBS) (Environmental Science and Engineering, Inc. [ESE], 1998). Category 7 sites are areas that are not evaluated and/or that require further evaluation.

IT prepared a site-specific field sampling plan (SFSP) addendum (IT, 1999) to the QST work plan (QST, 1998) that was finalized in September 1999. The SFSP addendum provided technical

guidance for sample collection and analysis at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). The SFSP was used as an attachment to the installation-wide work plan (IT, 1998) and the installation-wide sampling and analysis plan (SAP) (IT, 2000a). The installation-wide SAP includes the installation-wide safety and health plan and quality assurance plan.

The SI field work included the collection and analysis of eleven surface soil samples (by QST), four subsurface soil samples (one by IT and three by QST), and seven groundwater samples (four by IT and three by QST). The analytical results were used to determine if potential site-specific chemicals were present at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

1.2 Purpose and Objectives

The SI program was designed to collect data from site media and provide a level of defensible data and information in sufficient detail to determine whether chemical constituents are present at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), at concentrations that present an unacceptable risk to human health or the environment. The conclusions of the SI in Chapter 6.0 are based on the comparison of the analytical results to human health site-specific screening levels (SSSL), ecological screening values (ESV), and background screening values for FTMC. The SSSLs and ESVs were developed by IT as part of the human health and ecological risk evaluations associated with SIs being performed under the BRAC Environmental Restoration Program at FTMC. The SSSLs and ESVs are presented in the *Final Human Health and Ecological Screening Values and PAH Background Summary Report* (IT, 2000b). Background metals screening values are presented in the *Final Background Metals Survey Report, Fort McClellan, Alabama* (Science Applications International Corporation [SAIC], 1998).

Based on the conclusions presented in this SI report, the BRAC Cleanup Team will decide either to propose “No Further Action” or to conduct additional work at the site.

1.3 Site Description and History

The Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), are located in the north-central portion of the FTMC Main Post (Figure 1-1) in a wooded area located approximately 150 feet west of Goode Road (formerly 10th Street) (Figure 1-2). The parcel is a diamond-shaped area measuring approximately 250 feet (east-west) by 500 feet (north-south). Buildings 4428 and 4430, located on the southeast side of Trench Hill in the northern Main Post, are believed to have been constructed as coal-fired incinerators. Approximately 50 feet northeast of Building 4430

are coal storage bins constructed of cinder block. The bins are 2 to 3 feet tall and occupy an area of approximately 20 feet by 20 feet.

The Former Incinerators, Buildings 4428 and 4430, were reportedly also used for storing heavy equipment parts from 1962 through 1964, and FTMC personnel used one of the fire boxes as an incinerator in the 1950s and 1960s. Wooden vehicle crates, paper boxes, fan belts, and hoses were burned at this facility. A 6-by-4-foot concrete sump 3 feet in depth was observed immediately southwest of Building 4428 (Figure 1-2).

Site elevation ranges from approximately 800 ft above mean sea level (ft msl) to approximately 780 ft msl.

No other information was available regarding activities at this site (ESE, 1998).

2.0 Previous Investigations

An EBS was conducted by ESE to document current environmental conditions of all FTMC property (ESE, 1998). The study was to identify sites that, based on available information, have no history of contamination and comply with DOD guidance for fast-track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria:

1. Areas where no storage, release, or disposal of hazardous substances or petroleum products has occurred (including no migration of these substances from adjacent areas)
2. Areas where only release or disposal of petroleum products has occurred
3. Areas where release, disposal, and/or migration of hazardous substances has occurred, but at concentrations that do not require a removal or remedial response
4. Areas where release, disposal, and/or migration of hazardous substances has occurred, and all removal or remedial actions to protect human health and the environment have been taken
5. Areas where release, disposal, and/or migration of hazardous substances has occurred, and removal or remedial actions are underway, but all required remedial actions have not yet been taken
6. Areas where release, disposal, and/or migration of hazardous substances has occurred, but required actions have not yet been implemented
7. Areas that are not evaluated or require additional evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, the Alabama Department of Environmental Management (ADEM), the U.S. Environmental Protection Agency (EPA) Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historical maps and aerial photographs were reviewed to document historical land uses. Personal and telephone interviews of past and present

FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

Previous investigations to document site environmental conditions have not been conducted at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Therefore, the site was classified as a Category 7 CERFA site: areas that are not evaluated or require further evaluation.

3.0 Current Site Investigation Activities

This chapter summarizes SI activities conducted by IT and QST at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), including environmental sampling and analysis, and groundwater monitoring well installation activities.

3.1 Environmental Sampling

The environmental sampling performed during the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), included the collection of surface soil samples, subsurface soil samples, and groundwater samples for chemical analyses. The sample locations were determined by observing site physical characteristics during a site walkover and by reviewing historical documents pertaining to activities conducted at the site. The sample locations, media, and rationales are summarized in Table 3-1. Samples collected by IT are designated with the prefix “GSBP-96,” and samples collected by QST are designated with the prefix “SI08.” Sampling locations are shown on Figure 3-1. Samples were submitted for laboratory analyses of site-related parameters listed in Section 3.3.

The initial SI sampling effort performed by QST focused primarily on potential discharges onto the land surface. Because a wide range of potential contaminant sources may have been incinerated at this site, a broad-based target analyte suite was selected for these environmental samples.

3.1.1 Surface Soil Sampling

A total of eleven surface soil samples were collected by QST during the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Soil sampling locations and rationales are presented in Table 3-1. Sampling locations are shown on Figure 3-1. Sample designations and quality assurance/quality control (QA/QC) samples are listed in Table 3-2. Soil sampling locations were determined in the field by the on-site geologist based on the sampling rationale, presence of surface structures, and site topography.

QST collected eleven surface soil samples at Parcel 96(7) from 0 to 1 foot below ground surface (bgs) with either direct-push technology (DPT) or a stainless-steel hand auger in accordance with the QST work plan (QST, 1998). The samples were analyzed for parameters listed in Table 3-2 using methods outlined in Section 3.3. Sample collection logs are included in Appendix A.

3.1.2 Subsurface Soil Sampling

A total of four subsurface soil samples were collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), from three soil borings (QST) and from one boring for the GSBP-96-MW04 monitoring well (IT), as shown on Figure 3-1. Subsurface soil sampling locations and rationales are presented in Table 3-1. Subsurface soil sample designations, depths, and QA/QC samples are listed in Table 3-2. Soil boring sampling locations were determined in the field by the on-site geologist based on sampling rationale, presence of surface structures, and site topography.

IT Sample Collection. IT collected a subsurface soil sample from GSBP-96-MW04 at a depth of 1 to 3 feet bgs in the unsaturated zone. The soil boring was advanced and the soil sample collected using a hand auger following the methodology specified in Section 4.9.1.1 of the SAP (IT, 2000a). The sample collection log is included in Appendix A. The sample was analyzed for the parameters listed in Table 3-2 using methods outlined in Section 3.3.

The subsurface soil sample was field-screened using a photoionization detector (PID) in accordance with Section 4.7.1.1 of the SAP (IT, 2000a) to measure for volatile organic vapors. The sample displaying the highest reading was selected and sent to the laboratory for analysis. The soil fraction for volatile organic compound (VOC) analysis was collected directly from the sampler with three EnCore® samplers. The remaining portion of the sample was transferred to a clean stainless-steel bowl, homogenized, and placed in the appropriate sample containers. The sample submitted for laboratory analysis is summarized in Table 3-2. The on-site geologist constructed a detailed boring log as presented in Appendix B. At the completion of soil sampling, the borehole was advanced and converted into a permanent monitoring well.

QST Sample Collection. QST contracted Graves Service Company, Inc. to complete the soil borings. QST collected three subsurface soil samples at a depth of 3 to 4 feet bgs using a direct-push sampling system, in accordance with procedures outlined in the QST work plan (QST, 1998).

3.1.3 Well Installation

A total of seven groundwater monitoring wells were installed at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), as shown on Figure 3-1. IT installed four permanent groundwater monitoring wells, and QST installed three temporary groundwater monitoring wells. QST attempted a fourth temporary groundwater monitoring well using DPT but reached refusal before encountering groundwater. Table 3-3 summarizes construction details of the wells

installed at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). The well construction logs are included in Appendix B.

IT Well Installation. IT installed four permanent monitoring wells in the residuum groundwater zone at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), to collect groundwater samples for laboratory analysis.

IT contracted Miller Drilling, Inc., to install the wells with a hollow-stem auger rig at the locations shown on Figure 3-1. The wells were installed following procedures outlined in Section 4.7 and Appendix C of the SAP (IT, 2000a). The boreholes were advanced with a 4.25-inch inside diameter (ID) hollow-stem auger from ground surface to the first water-bearing zone in residuum. A 2-foot-long, 2-inch ID carbon steel split-spoon sampler was driven at 5-foot intervals to collect residuum for observing and describing lithology. Where split-spoon refusal was encountered, the auger was advanced until the first water-bearing zone was encountered. The on-site geologist constructed a lithological log for the borehole by logging the auger drill cuttings. The drill cuttings were logged to determine lithologic changes and the approximate depth of groundwater encountered during drilling. This information was used to determine the optimal placement of the monitoring well screen interval and to provide site-specific geological and hydrogeologic information. The lithological logs for the boreholes are included in Appendix B.

Upon reaching the target depth, a 10-foot-length of 2-inch ID, 0.010-inch factory slotted, Schedule 40 polyvinyl chloride (PVC) screen with a 3-inch PVC end cap was placed through the auger to the bottom of the borehole. The screen and end cap were attached to 2-inch ID, flush-threaded Schedule 40 PVC riser. A sand pack consisting of number 1 filter sand (environmentally safe, clean fine sand, sieve size 20 to 40) was tremied around the well screen to approximately 2 feet above the top of the well screen as the augers were removed. The well was surged using a solid PVC surge block for approximately 10 minutes, or until no more settling of the filter sand occurred inside the borehole. A bentonite seal, consisting of approximately 2 feet of bentonite pellets, was placed immediately on top of the sand pack and hydrated with potable water. If the bentonite seal was installed below the water table surface, the bentonite pellets were allowed to hydrate in the groundwater. The bentonite seal placement and hydration followed procedures in Appendix C of the SAP (IT, 2000a). The well was then grouted to ground surface. A locking well cap was placed on the PVC well casing. The well surface completion included placing a protective steel casing over the PVC riser and installing a concrete pad around the protective steel casing. Concrete-filled protective steel posts were placed around the well pad.

The well was developed by surging and pumping with a submersible pump in accordance with methodology outlined in Section 4.8 and Appendix C of the SAP (IT, 2000a). The submersible pump used for well development was moved in an up-and-down fashion to encourage any residual well installation materials to enter the well. These materials were then pumped out of the well in order to re-establish the natural hydraulic flow conditions. The well was repeatedly purged dry and readings were not taken.

QST Well Installation. QST installed three temporary monitoring wells in the residuum groundwater zone at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), using DPT. The temporary wells were installed in accordance with procedures outlined in the QST work plan (QST, 1998). Table 3-3 summarizes construction details of the wells installed by QST at the site. The well construction logs are included in Appendix B.

QST contracted Graves Service Company Inc., to install the temporary wells at Parcel 96(7) with DPT at the locations shown on Figure 3-1. The temporary wells were installed, purged, sampled, and removed within 24 hours. Initially, a 2-inch diameter borehole for each temporary well was installed using DPT. The 2-inch borehole was advanced up to 5 feet into the uppermost water-bearing zone. Soil descriptions were prepared by the QST geologist and are presented in Appendix B of this SI report. Upon reaching the target depth at each borehole, a 10-foot-length of 1-inch (nominal) diameter Schedule 40 PVC slotted screen (0.010-inch) was attached to a 1-inch (nominal) PVC riser and lowered into the borehole (SI08-GWS02 had a 20-foot screen). A sand pack consisting of 20/40 silica sand was placed into the annular space to the ground surface.

A boring log is also provided in Appendix B of this SI report for the attempted fourth well. No groundwater was encountered prior to refusal at this location.

3.1.4 Water Level Measurements

The depth to groundwater was measured in the permanent wells installed by IT at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), on March 14, 2000, following procedures outlined in Section 4.18 of the SAP (IT, 2000a). Depth to groundwater was measured with an electronic water level meter. Measurements were referenced to the top of the well casing (Table 3-4).

3.1.5 Groundwater Sampling

Groundwater samples were collected from a total of seven monitoring wells at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). IT collected a groundwater sample from each of the four permanent monitoring wells (GSBP-96-MW01, GSBP-96-MW02, GSBP-96-MW03, and GSBP-96-MW04), and QST collected groundwater screening samples from three small-diameter DPT wells (SI08-GWS01, SI08-GWS02, and SI08-GWS03). Because the DPT wells did not produce sufficient water for the complete analytical suite, only VOC fractions were collected from these locations. The well locations are shown on Figure 3-1. The groundwater sampling locations and rationales are listed in Table 3-1. The groundwater sample designations and QA/QC samples are presented in Table 3-5.

IT Sample Collection. Groundwater sample collection was performed following procedures outlined in Section 4.9.1.4 of the SAP (IT, 2000a). Groundwater was sampled after purging a minimum of three well volumes and after field parameters (temperature, pH, dissolved oxygen, specific conductivity, oxidation-reduction potential, and turbidity) stabilized. Purging and sampling were performed with a submersible pump equipped with Teflon™ tubing. Field parameters were measured using a calibrated water-quality meter. Field parameter readings are summarized in Table 3-6. Sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

QST Sample Collection. QST collected groundwater samples immediately following completion of well purging using a peristaltic pump and vacuum jar. Groundwater sample parameters were recorded for pH, conductivity, and temperature. Turbidity, dissolved oxygen, and oxidation-reduction potential were not monitored. Field parameter readings are summarized in Table 3-6. QST sample collection logs are included in Appendix A. The samples were analyzed for the parameters listed in Table 3-5 using methods outlined in Section 3.3.

3.2 Surveying of Sample Locations

IT sample locations were surveyed using global positioning system survey techniques described in Section 4.3 of the SAP (IT, 2000a) and conventional civil survey techniques described in Section 4.19 of the SAP (IT, 2000a). Horizontal coordinates were referenced to the U.S. State Plane Coordinate System, Alabama East Zone, North American Datum of 1983. Elevations were referenced to the North American Vertical Datum of 1988. Horizontal coordinates and elevations are included in Appendix D.

QST surveyed sample locations using global positioning system survey techniques or traditional surveying techniques described in the QST work plan (QST, 1998). Map coordinates for each sample location were determined using a Transverse Mercator or State Planar grid to within ± 3 feet (± 1 meter). Horizontal coordinates are included in Appendix D.

3.3 Analytical Program

Samples collected during the SI were analyzed for various chemical parameters. The specific suite of analyses performed was based on the potential site-specific chemicals historically at the site and EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), included:

- Target compound list VOCs - EPA Method 5035/8260B
- Target compound list semivolatile organic compounds (SVOC) - EPA Method 8270C
- Target analyte list metals - EPA Method 6010B/7000
- Total organic carbon (TOC) - EPA Method 9060 (two subsurface soil samples)
- Dioxins - EPA Method 8290 (one subsurface soil sample)
- Polychlorinated biphenyls (PCB) - EPA Method 8082 (IT samples only)
- Pesticides/PCBs - EPA Method 8081A (QST samples only).

The samples were analyzed using EPA SW-846 methods, including Update III Methods where applicable.

3.4 Sample Preservation, Packaging, and Shipping

IT preserved, packaged, and shipped samples following requirements specified in Section 4.13.2 of the SAP (IT, 2000a). Sample containers, sample volumes, preservatives, and holding times for the analyses required in this SI are listed in Chapter 5.0, Table 5-1, of Appendix B of the SAP (IT, 2000a). Sample documentation and chain-of-custody records were recorded as specified in Section 4.13 of the SAP (IT, 2000a). Completed analysis request and chain-of-custody records (Appendix A) were secured and included with each shipment of sample coolers to Quanterra Environmental Services in Knoxville, Tennessee. Split samples were shipped to the USACE South Atlantic Division Laboratory in Marietta, Georgia.

QST preserved, packaged, and shipped samples following guidelines specified in the QST work plan (QST, 1998).

3.5 Investigation-Derived Waste Management and Disposal

IT Investigation-Derived Waste. IT investigation-derived waste (IDW) was managed and disposed as outlined in Appendix D of the SAP (IT, 2000a). The IDW generated during the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), was segregated as follows:

- Drill cuttings
- Purge water from well development and sampling activities and decontamination fluids
- Spent well materials and personal protective equipment.

Solid IDW was stored inside the fenced area surrounding Buildings 335 and 336 in lined roll-off bins prior to characterization and final disposal. Solid IDW was characterized using toxicity characteristic leaching procedure (TCLP) analyses. Based on the results, drill cuttings and personal protective equipment generated during the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), were disposed as nonregulated waste at the Industrial Waste Landfill on the Main Post of FTMC.

Liquid IDW was contained in the existing 20,000-gallon sump associated with the Building T-338 vehicle washrack. Liquid IDW was characterized by VOC, SVOC, and metals analyses. Based on the analyses, liquid IDW was discharged as nonregulated waste to the FTMC wastewater treatment plant on the Main Post.

QST Investigation-Derived Waste. QST-generated IDW was managed and disposed as outlined in the QST work plan (QST, 1998).

3.6 Variances/Nonconformances

Neither IT nor QST documented any variances or nonconformances during completion of the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

3.7 Data Quality

IT Data. The field sample analytical data are presented in tabular form in Appendix E. The field samples were collected, documented, handled, analyzed, and reported in a manner consistent with the SI work plan (IT, 1999); the FTMC SAP and quality assurance plan; and

standard, accepted methods and procedures. Sample collection logs pertaining to the collection of these samples were reviewed and organized for this report and are included in Appendix A. As discussed in Section 3.6, there were not any variances or nonconformances to impact the usability of the data.

Data were reported and evaluated in accordance with USACE South Atlantic Savannah Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of Appendix B of the SAP [IT, 2000a]). Chemical data were reported via hard-copy data packages by the laboratory using Contract Laboratory Program-like forms. A summary of validated analytical data is included in Appendix E. A complete (100 percent) Level III data validation effort was performed on the reported analytical data. Appendix F includes a data validation summary report that discusses the results of the IT data validation. Selected results were rejected or otherwise qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the report. The validation-assigned qualifiers were added to the FTMC ITEMS™ database for tracking and reporting.

QST Data. QST data were submitted to the IRDMIS database at the conclusion of QST field activities. Hard-copy data packages were sent to the AEC in Edgewood, Maryland, for storage. IT retrieved the electronic data via IRDMIS and the original data packages from the AEC for evaluation. From the IRDMIS data, IT was able to identify the key fields of information (analytical records, well construction and geotechnical information, sample location information, and water level readings) and translate the data into the ITEMS database.

The field sample analytical data are presented in tabular form in Appendix E. QST hard-copy analytical data packages were validated during a complete (100 percent) Level III data validation effort. Appendix F includes a data validation summary report that discusses the results of the QST data validation. Selected results were rejected or qualified based on the implementation of accepted data validation procedures and practices. These qualified parameters are highlighted in the data validation report. In addition, during the validation the electronic results were compared to the hard-copy results. Concentrations in the database were corrected where necessary and validation qualifiers added to the QST data using ITEMS to reflect the findings summarized in the QST data validation report.

After the QST data validation was complete and the results were updated, the QST and IT data

were merged using ITEMS for inclusion in this SI report. The combined validated analytical data are presented in tabular form in Appendix E. The validated data were used in the comparisons to the SSSLs and ESVs developed by IT. The IT and QST data presented in this report, except where qualified, meet the principle data quality objective for this SI.

4.0 Site Characterization

Subsurface investigations performed at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), provided soil, geologic, and groundwater data used to characterize the geology and hydrogeology of the site.

4.1 Regional and Site Geology

4.1.1 Regional Geology

Calhoun County includes parts of two physiographic provinces, the Piedmont Upland Province and the Valley and Ridge Province. The Piedmont Upland Province occupies the extreme eastern and southeastern portions of the county and is characterized by metamorphosed sedimentary rocks. The generally accepted range in age of these metamorphics is Cambrian to Devonian.

The majority of Calhoun County, including the Main Post of FTMC, lies within the Appalachian fold-and-thrust structural belt (Valley and Ridge Province) where southeastward-dipping thrust faults with associated minor folding are the predominant structural features. The fold-and-thrust belt consists of Paleozoic sedimentary rocks that have been asymmetrically folded and thrust-faulted, with major structures and faults striking in a northeast-southwest direction.

Northwestward transport of the Paleozoic rock sequence along the thrust faults has resulted in the imbricate stacking of large slabs of rock referred to as thrust sheets. Within an individual thrust sheet, smaller faults may splay off the larger thrust fault, resulting in imbricate stacking of rock units within an individual thrust sheet (Osborne and Szabo, 1984). Geologic contacts in this region generally strike parallel to the faults, and repetition of lithologic units is common in vertical sequences. Geologic formations within the Valley and Ridge Province portion of Calhoun County have been mapped by Warman and Causey (1962), Osborne and Szabo (1984), and Moser and DeJarnette (1992), and vary in age from Lower Cambrian to Pennsylvanian.

The basal unit of the sedimentary sequence in Calhoun County is the Cambrian Chilhowee Group. The Chilhowee Group consists of the Cochran, Nichols, Wilson Ridge, and Weisner Formations (Osborne and Szabo, 1984) but in Calhoun County is either undifferentiated or divided into the Cochran and Nichols Formations and an upper, undifferentiated Wilson Ridge and Weisner Formation. The Cochran is composed of poorly sorted arkosic sandstone and conglomerate with interbeds of greenish-gray siltstone and mudstone. Massive to laminated,

greenish-gray and black mudstone makes up the Nichols Formation, with thin interbeds of siltstone and very fine-grained sandstone (Szabo et al., 1988). These two formations are mapped only in the eastern part of the county.

The Wilson Ridge and Weisner Formations are undifferentiated in Calhoun County and consist of both coarse-grained and fine-grained clastics. The coarse-grained facies appears to dominate the unit and consists primarily of coarse-grained, vitreous quartzite, and friable, fine- to coarse-grained, orthoquartzitic sandstone, both of which locally contain conglomerate. The fine-grained facies consists of sandy and micaceous shale and silty, micaceous mudstone, which are locally interbedded with the coarse clastic rocks. The abundance of orthoquartzitic sandstone and quartzite suggests that most of the Chilhowee Group bedrock in the vicinity of FTMC belongs to the Weisner Formation (Osborne and Szabo, 1984).

The Cambrian Shady Dolomite overlies the Weisner Formation northeast, east and southwest of the Main Post and consists of interlayered bluish-gray or pale yellowish-gray sandy dolomitic limestone and siliceous dolomite with coarsely crystalline porous chert (Osborne et al., 1989). A variegated shale and clayey silt have been included within the lower part of the Shady Dolomite (Cloud, 1966). Material similar to this lower shale unit was noted in core holes drilled by the Alabama Geologic Survey on FTMC (Osborne and Szabo, 1984). The character of the Shady Dolomite in the FTMC vicinity and the true assignment of the shale at this stratigraphic interval are still uncertain (Osborne, 1999).

The Rome Formation overlies the Shady Dolomite and locally occurs to the northwest and southeast of the Main Post as mapped by Warman and Causey (1962) and Osborne and Szabo (1984), and immediately to the west of Reilly Airfield (Osborne and Szabo, 1984). The Rome Formation consists of variegated, thinly interbedded grayish-red-purple mudstone, shale, siltstone, and greenish-red and light gray sandstone, with locally occurring limestone and dolomite. The Conasauga Formation overlies the Rome Formation and occurs along anticlinal axes in the northeastern portion of Pelham Range (Warman and Causey, 1962; Osborne and Szabo, 1984) and the northern portion of the Main Post (Osborne et al., 1997). The Conasauga Formation is composed of dark-gray, finely to coarsely crystalline medium- to thick-bedded dolomite with minor shale and chert (Osborne et al., 1989).

Overlying the Conasauga Formation is the Knox Group, which is composed of the Copper Ridge and Chepultepec dolomites of Cambro-Ordovician age. The Knox Group is undifferentiated in

Calhoun County and consists of light medium gray, fine to medium crystalline, variably bedded to laminated, siliceous dolomite and dolomitic limestone that weather to a chert residuum (Osborne and Szabo, 1984). The Knox Group underlies a large portion of the Pelham Range area.

The Ordovician Newala and Little Oak Limestones overlie the Knox Group. The Newala Limestone consists of light to dark gray, micritic, thick-bedded limestone with minor dolomite. The Little Oak Limestone is comprised of dark gray, medium- to thick-bedded, fossiliferous, argillaceous to silty limestone with chert nodules. These limestone units are mapped together as undifferentiated at FTMC and other parts of Calhoun County. The Athens Shale overlies the Ordovician limestone units. The Athens Shale consists of dark-gray to black shale and graptolitic shale with localized interbedded dark gray limestone (Osborne et al., 1989). These units occur within an eroded “window” in the uppermost structural thrust sheet at FTMC and underlie much of the developed area of the Main Post.

Other Ordovician-aged bedrock units mapped in Calhoun County include the Greensport Formation, Colvin Mountain Sandstone, and Sequatchie Formation. These units consist of various siltstones, sandstones, shales, dolomites and limestones, and are mapped as one, undifferentiated unit in some areas of Calhoun County. The only Silurian-age sedimentary formation mapped in Calhoun County is the Red Mountain Formation. This unit consists of interbedded red sandstone, siltstone, and shale with greenish-gray to red silty and sandy limestone.

The Devonian Frog Mountain Sandstone consists of sandstone and quartzitic sandstone with shale interbeds, dolomudstone, and glauconitic limestone (Szabo et al., 1988). This unit locally occurs in the western portion of Pelham Range.

The Mississippian Fort Payne Chert and the Maury Formation overlie the Frog Mountain Sandstone and are composed of dark- to light-gray limestone with abundant chert nodules and greenish-gray to grayish-red phosphatic shale, with increasing amounts of calcareous chert toward the upper portion of the formation (Osborne and Szabo, 1984). These units occur in the northwestern portion of Pelham Range. Overlying the Fort Payne Chert is the Floyd Shale, also of Mississippian age, which consists of thin-bedded, fissile brown to black shale with thin intercalated limestone layers and interbedded sandstone. Osborne and Szabo (1984) reassigned

the Floyd Shale, which was mapped by Warman and Causey (1962) on the Main Post of FTMC, to the Ordovician Athens Shale on the basis of fossil data.

The Jacksonville Thrust Fault is the most significant structural geologic feature in the vicinity of FTMC, both for its role in determining the stratigraphic relationships in the area and for its contribution to regional water supplies. The trace of the fault extends northeastward for approximately 39 miles between Bynum, Alabama and Piedmont, Alabama. The fault is interpreted as a major splay of the Pell City Fault (Osborne and Szabo, 1984). The Ordovician sequence that makes up the Eden thrust sheet is exposed at FTMC through an eroded “window,” or “fenster,” in the overlying thrust sheet. Rocks within the window display complex folding, with the folds being overturned and tight to isoclinal. The carbonates and shales locally exhibit well-developed cleavage (Osborne and Szabo, 1984). The FTMC window is framed on the northwest by the Rome Formation, north by the Conasauga Formation, northeast, east, and southwest by the Shady Dolomite, and southeast and southwest by the Chilhowee Group (Osborne et al., 1997).

4.1.2 Site Geology

The soils mapped at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), consist of Anniston and Allen clay loam and Locust gravelly fine sandy loam. The Anniston and Allen clay loam is typically reddish-brown and is derived from shale or limestone bedrock. This soil has a slow infiltration and poor moisture capacity, which makes the soil very susceptible to erosion. The Locust gravelly fine sandy loam is typically dark grayish brown fine sandy loam to yellowish brown fine sandy clay loam derived from old local alluvium washed or sloughed from ridges and mountains of interbedded sandstone, shale and cherty limestone. Sandstone and quartz gravel is common. This soil has a medium infiltration, is moderately well drained, and is susceptible to erosion (U.S. Department of Agriculture, 1961).

The Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), are situated to the west of the Jacksonville Fault. The bedrock beneath the site is mapped as undifferentiated Mississippian/Ordovician Floyd and Athens Shale (Osborne et al, 1997). It is exposed due to the eroded “window” in the overlying thrust sheet. The Floyd and Athens Shale consists of brown, dark-gray to black shale with localized interbedded claystone, limestone and sandstone (Osborne et al. 1989)

Based on hollow-stem auger boring data collected during the SI, residuum beneath the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), consists predominantly of reddish-yellow to reddish-brown and light gray clay, with some sand and silt, overlying dark gray to black weathered shale. The depth to the weathered shale ranged from approximately 8 to 28 feet. Competent bedrock was not encountered during drilling.

4.2 Site Hydrology

4.2.1 Surface Hydrology

Precipitation in the form of rainfall averages about 54 inches annually in Anniston, Alabama, with infiltration rates annually exceeding evapotranspiration rates (U.S. Department of Commerce, 1998). The major surface water features at the Main Post of FTMC include Remount Creek, Cane Creek, and Cave Creek. These waterways flow in a general northwest to westerly direction towards the Coosa River on the western boundary of Calhoun County.

Surface runoff at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), follows the general topography and flows west-northwest towards a creek located approximately 250 feet northwest of the parcel. The creek flows to the southwest.

4.2.2 Hydrogeology

The static groundwater level was measured in the four permanent monitoring wells on March 14, 2000, as summarized in Table 3-4. Groundwater flow is generally to the west towards the creek (Figure 4-1). This suggests that the area is hydraulically connected to the creek.

During boring and well installation activities, groundwater was encountered at, or just below the top of the weathered shale. This was at 32 feet bgs at GSBP-96-MW01 and GSBP-96-MW02, at 33 feet bgs at GSBP-96-MW03, and at 44 feet bgs at GSBP-96-MW04. The static groundwater levels for these wells, summarized in Table 3-4, are higher than the depth groundwater was encountered during drilling. This indicates that the groundwater has an upward hydraulic head and is under semiconfined conditions.

5.0 Summary of Analytical Results

The results of the chemical analyses of samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), indicate that metals, VOCs, SVOCs, pesticides, PCBs, and dioxins were detected in the various site media. To evaluate whether the detected constituents present an unacceptable risk to human health and the environment, analytical results were compared to the human health SSSLs and ESVs for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC.

Metal concentrations exceeding the SSSLs and ESVs were subsequently compared to metals background screening values (background concentrations) (SAIC, 1998) to determine if the metals concentrations are within natural background concentrations. Summary statistics for background metals samples collected at FTMC (SAIC, 1998) are included in Appendix G.

Six compounds were quantified by both SW-846 Method 8260B (as VOC) and Method 8270C (as SVOC), namely 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, 1,3-dichlorobenzene, 1,2-dichlorobenzene, hexachlorobutadiene, and naphthalene. Method 8260B yields a reporting limit of 0.005 milligrams per kilogram (mg/kg), while Method 8270C has a reporting limit of 0.330 mg/kg, which is typical for a soil matrix sample. As a result of the direct nature of the Method 8260B analysis and its resulting lower reporting limit, this method should be considered superior to Method 8270C when quantifying low levels (0.005 to 0.330 mg/kg) of these compounds. Method 8270C and its associated methylene chloride extraction step is superior, however, when dealing with samples that contain higher concentrations (greater than 0.330 mg/kg) of these compounds. Therefore, all data were considered, and none were categorically excluded. Data validation qualifiers were helpful in evaluating the usability of data, especially if calibration, blank contamination, precision, or accuracy indicator anomalies were encountered.

The following sections and Tables 5-1 through 5-3 summarize the results of the comparisons of detected constituents to the SSSLs, ESVs, and background screening values. Complete analytical results are presented in Appendix E.

5.1 Surface Soil Analytical Results

Eleven surface soil samples were collected for chemical analysis at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Surface soil samples were collected from the upper 1 foot of soil at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs, ESVs, and metals background screening values, as presented in Table 5-1.

Metals. Twenty-one metals were detected in the eleven surface soil samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Seven mercury results were flagged with a “B” data qualifier, signifying that mercury was also detected in an associated laboratory or field blank sample.

The concentrations of aluminum (at four locations), arsenic (eight locations), chromium (one location), iron (eleven locations), and thallium (three locations) exceeded human health SSSLs. With the exception of iron at two locations (SI08-SS01 and SI08-SS04), the concentrations of these metals were below their respective background concentrations. The iron results were within the range of background values (Appendix G).

The concentrations of aluminum (eleven locations), cadmium (SI08-SS10), chromium (eleven locations), copper (SI08-SS01), iron (eleven locations), lead (SI08-SS08), manganese (SI08-SS07), mercury (two locations), silver (SI08-SS01), thallium (SI08-SS04), vanadium (eleven locations), and zinc (four locations) exceeded ESVs. With the exception of cadmium, copper, iron (two locations), lead, mercury (two locations), silver, and zinc (four locations), the concentrations of these metals were below their respective background concentrations. The copper and silver results in SI08-SS01 slightly exceeded their respective ranges of background results. Cadmium and zinc results (SI08-SS10) exceeded their respective ranges of background results. However, SI08-SS10 is a floor residue sample collected within Building 4430. All other metals results exceeding ESVs were within the range of background (Appendix G).

Volatile Organic Compounds. Twelve VOCs were detected in surface soil samples collected at the site. Nine methylene chloride results and four trichloroethene (TCE) results were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. VOC concentrations in the surface soil samples ranged from 0.00072 to 1.1 mg/kg, and the cumulative concentration was 4.83 mg/kg.

VOC concentrations in surface soils were below SSSLs. Concentrations of tetrachloroethene (nine locations) and TCE (ten locations) exceeded ESVs.

Semivolatile Organic Compounds. Thirteen SVOCs, including eleven polynuclear aromatic hydrocarbon (PAH) compounds, were detected in surface soil samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). The bis(2-ethylhexyl)phthalate results were flagged with a “B” data qualifier, signifying that this compound was also detected in an associated laboratory or field blank sample. SVOCs were not detected at two sample locations (SI08-SS09 and SI08-SS10), and bis(2-ethylhexyl)phthalate was the only detected SVOC at four additional locations. Sample location SI08-SS03 contained 12 of the 13 detected SVOCs. SVOC concentrations in the surface soil samples ranged from 0.01 to 0.92 mg/kg, and the cumulative concentration was 7.12 mg/kg.

With the exception of two PAH compounds in one sample, the concentrations of the detected SVOCs were below SSSLs and ESVs. Fluoranthene and pyrene concentrations exceeded ESVs at sample location SI08-SS11 but were below SSSLs.

Pesticides/Polychlorinated Biphenyls (PCB). Three pesticides (4,4'-dichlorodiphenyldichloroethane [DDD], 4,4'-dichlorodiphenyldichloroethene [DDE], and 4,4'-dichlorodiphenyltrichloroethane [DDT]) were detected in surface soil samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). PCBs were not detected in the surface soil samples. Pesticide concentrations in surface soil samples ranged from 0.002 to 0.37 mg/kg, and the cumulative concentration was 0.9 mg/kg.

Pesticide concentrations in surface soils were below SSSLs. The concentrations of 4,4'-DDD (SI08-SS11), 4,4'-DDE (six locations), and 4,4'-DDT (six locations) exceeded ESVs.

5.2 Subsurface Soil Analytical Results

Four subsurface soil samples were collected for chemical analysis at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Subsurface soil samples were collected at depths greater than 1 foot bgs at the locations shown on Figure 3-1. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-2.

Metals. Nineteen metals were detected in the four subsurface soil samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). The concentrations of six metals (aluminum, arsenic, chromium, iron, thallium, and vanadium) exceeded SSSLs.

Of these metals, the concentrations of aluminum (three locations), iron (two locations), and vanadium (two locations) also exceeded their respective background concentrations. With the exception of the iron results at SI08-SS02 and SI08-SS03, these metals results were within the range of background values established by SAIC (1998) (Appendix G).

Volatile Organic Compounds. Ten VOCs were detected in subsurface soil samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Detections of 1,1,1-trichloroethane (two samples), methylene chloride (four samples), and TCE (one sample) were flagged with a “B” data qualifier, signifying that these compounds were also detected in an associated laboratory or field blank sample. VOC concentrations in the subsurface soil samples ranged from 0.0011 to 1.1 mg/kg, and the cumulative concentration was 1.28 mg/kg.

The VOC concentrations in subsurface soils were below SSSLs.

Semivolatile Organic Compounds. One SVOC compound (bis[2-ethylhexyl]phthalate), was detected in three of the four subsurface soil samples collected at the site. The bis (2-ethylhexyl)phthalate concentrations were below the SSSL.

Dioxins. One surface soil sample (GSBP-96-MW04) was analyzed for dioxins. Three dioxin compounds were detected in the sample at concentrations below SSSLs.

Total Organic Carbon. Two subsurface soil samples (SI08-SS01 and SI08-SS03) were analyzed for TOC content. TOC concentrations in the samples were 866 mg/kg and 4,200 mg/kg, as summarized in Appendix E.

5.3 Groundwater Analytical Results

Four permanent monitoring wells and three temporary monitoring wells were sampled at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), at the locations shown on Figure 3-1. Groundwater samples from the three temporary DPT wells were analyzed for VOCs only. Analytical results were compared to residential human health SSSLs and metals background screening values, as presented in Table 5-3.

Metals. Nineteen metals were detected in groundwater samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). Thirteen of the nineteen metals were detected at concentrations exceeding SSSLs in monitoring well GSBP-96-MW04, and eight were detected at concentrations exceeding SSSLs at GSBP-96-MW04. Several results, particularly from the GSBP-96-MW04 sample, were greater than the maximum concentration in the range of background concentrations (Appendix G). Both of these samples were collected with turbidity readings greater than 1,000 nephelometric turbidity unit (NTU). Therefore, the elevated metals concentrations from these samples are likely the result of high turbidity at the time of sample collection. The effect of high turbidity on metals concentrations in groundwater has been previously demonstrated in a groundwater resampling study conducted by IT at FTMC (IT, 2000c) (Appendix H).

In contrast, samples collected from two wells with turbidity of 58 NTU and 107 NTU resulted in greatly reduced concentrations of metals. In these two samples, six of the nineteen metals were detected at concentrations exceeding SSSLs. Chromium (GSBP-96-MW01), copper (BSBP-96-MW02), mercury (both locations), and thallium (both locations) results were flagged with a “B” data qualifier, signifying that these metals were also detected in an associated laboratory or field blank sample. Aluminum, chromium, and vanadium (GSBP-96-MW02), iron, manganese, and thallium (both locations) were detected at concentrations greater than the human health SSSLs. With the exception of aluminum and thallium, the concentrations of these metals were below their respective background concentrations. The aluminum and thallium results were within the respective range of background values (Appendix G).

Volatile Organic Compounds. Five VOCs (2-butanone, acetone, carbon disulfide, chloromethane, and methylene chloride) were detected in samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7). The chloromethane results, methylene chloride results, and two of the acetone results were flagged with a “B” data qualifier, indicating that these compounds were also detected in an associated laboratory or field blank sample. VOC concentrations in the groundwater samples ranged from 0.00014 to 0.022 milligrams per liter (mg/L), and the cumulative concentration was 0.043 mg/L.

VOCs concentrations in groundwater were below SSSLs.

Semivolatile Organic Compounds. Di-n-butyl phthalate was detected in one groundwater sample (GSBP-96-MW02) at a concentration below the SSSL.

6.0 Summary, Conclusions, and Recommendations

IT, under contract with the USACE, completed the SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), at FTMC in Calhoun County, Alabama. The SI was conducted to determine whether chemical constituents are present at the site at concentrations that present an unacceptable risk to human health or the environment. The SI at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), consisted of the sampling and analysis of eleven surface soil samples, four subsurface soil samples, and seven groundwater samples. In addition, four permanent groundwater monitoring wells and three temporary groundwater monitoring wells were installed in the residuum groundwater zone to facilitate groundwater sample collection and to provide site-specific geological and hydrogeological characterization information. As part of the SI, IT incorporated data previously collected by QST at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

Chemical analyses of samples collected at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7) indicate that metals, VOCs, SVOCs, pesticides, and dioxins were detected in the various site media. Analytical results were compared to the human health site-specific screening levels (SSSL) and ecological screening values (ESV) for FTMC. The SSSLs and ESVs were developed by IT for human health and ecological risk evaluations as part of the ongoing SIs being performed under the BRAC Environmental Restoration Program at FTMC. Additionally, metal concentrations exceeding SSSLs and ESVs were compared to media-specific background screening values (SAIC, 1998).

The potential impact to human receptors is expected to be minimal. Although the site is projected for passive recreation reuse, the analytical data were screened against residential human health SSSLs to evaluate the site for possible unrestricted future use. In soils, metals that exceeded SSSLs were below their respective background concentrations or within the range of background values, with the exception of copper and silver in one surface soil sample (SI08-SS01). VOC, SVOC, pesticide, and dioxin analytical results were below SSSLs.

In groundwater, several metals were detected at concentrations exceeding SSSLs and background concentrations. However, the samples with the elevated metals results had high turbidity at the time of sample collection, which is believed to have caused the increased metals concentrations. Evaluation of lower-turbidity groundwater samples indicates that metals have not adversely

impacted groundwater at the site. VOC and SVOC concentrations in groundwater were below SSSLs.

Several metals were detected in surface soil at concentrations exceeding ESVs and background concentrations within and adjacent to Building 4430. Concentrations of TCE and PCE exceeded ESVs in several samples; however, 40 percent of these TCE results were in samples associated with a laboratory or field blank also containing TCE. Two pesticides (4,4'-DDT and 4,4'-DDE) exceeded ESVs in six surface soil samples. Since the site is located within the developed area of the Main Post and viable ecological habitat is limited, the threat to potential ecological receptors is low.

Based on the results of the SI, past operations at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7), do not appear to have adversely impacted the environment. The metals and chemical compounds detected in site media do not pose an unacceptable risk to human health or the environment. Therefore, IT recommends "No Further Action" and unrestricted land reuse at the Former Incinerators, Buildings 4428 and 4430, Parcel 96(7).

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